the range varies quite considerably in the North Auckland samples even in relatively adjacent ones such as 20 and 21,, which refer to Waipoua Forest and Maunganui Bluff respectively. South of Auckland the range in width also varies considerably being influenced by the presence or absence of a second species in the samples.

The frequency of protoconch widths is shown in Fig. 65, North Auckland and South Auckland samples being treated separately. Here the marked bimodality in the latter samples shows the presence of two species, the first peak being due to specimens of *P. ponsonbyi* and the second to *P. giveni* specimens. The North Auckland samples show only one peak, which coincides, apart from a slight shift to the left with the *P. giveni* peak of the South Auckland curve. There is a minor insignificant overlap in protoconch width in the two species, but this involves only a small number of specimens, some of which may have been affected by injury. Protoconch width as a microscopic diagnostic character may thus be used with some certainty where samples contain a number of specimens and averages may be ascertained.

ii. *Elevation*

In most samples the more raised protoconch of *P. ponsonbyi* is marked, and this becomes with a little practice, a useful macroscopic character for separating species (Figs. 62, 63). Occasionally rather flatter protoconchs are present, as was noted in the sample from Te Aroha.

iii. Sculpture

The sculpture of the protoconch clearly separates all except the old and badly worn specimens. In *P. ponsonbyi* the close microscopic spiral striation is quite marked and contrasts strongly with the relatively smooth yet randomly finely pitted condition in *P. giveni* (Figs. 62, 63).

Characters of the Post-Nuclear Whorls

i. *Riblet Frequencies**

Cursory examination indicated that *P. ponsonbyi* might be the more finely ribbed of the two species. However, material for each from three localities widely distributed in their ranges was examined to establish post-nuclear whorl riblet frequencies. This consisted in the case of *P. giveni* of samples from Mangamuka Bridge (55 specimens), Clevedon (30), and Pahiatua Track (Palmerston North) (17), and in the case of *P. ponsonbyi* from Clevedon (20), Kawhia (20), and Mt. Messenger (15), the majority of specimens running to three post-nuclear whorls. The whorl riblet frequency distributions (samples of each species lumped together) are shown in Fig. 66. It is realized that the maximum range in variation is not necessarily obtained by spacing a limited number of samples throughout the geographical range, because of the ability of local populations to become relatively isolated, but such spacing does help cover the possibility of clinal variation and would appear to be the preferable procedure where a few samples are analysed.

Fig. 66 shows that in considering variation throughout the range of the two species, there are not significant differences in the post-nuclear whorl riblet counts. However, the variation in riblet counts in each species is of such magnitude that it does not preclude the possibility of statistically significant differences in counts in samples from different localities within the same or the two species. Table I provides such an instance. Here the counts of *P. giveni* (Mangamuka) and *P. ponsonbyi* (Clevedon) are significantly different at the 1% level for whorls two and three, but not whorl one. It is interesting to note that in Suter's tube of *P. giveni* and *P. ponsonbyi* the post-nuclear whorl riblet counts are 35/70/73, 35/58/74 and 36/57/82, 33/63/98, 41/65/107 respectively, which would immediately lead one to

* The beginnings and endings of the post-nuclear whorls were determined by the points at which riblets meet the periphery.